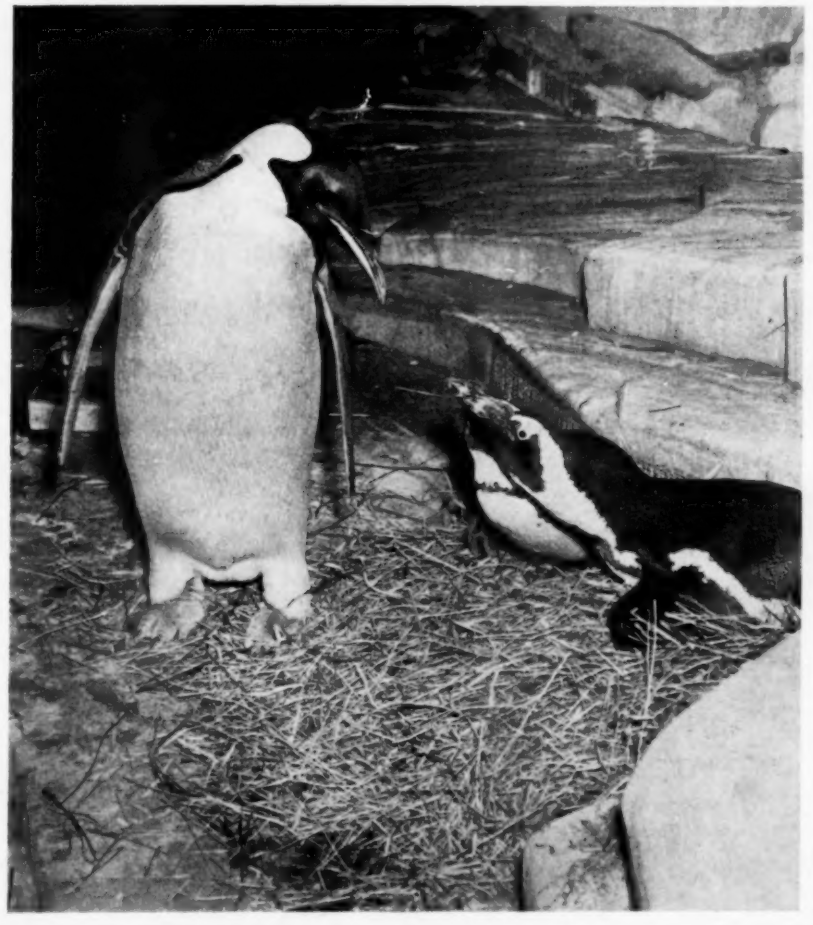
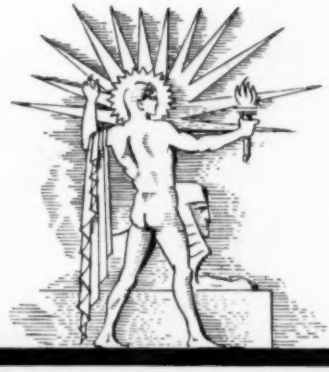
SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •





March 16, 1940

Imperial Majesty

See Page 168

A SCIENCE SERVICE PUBLICATION

Do You Know?

Ancient Peruvians prized *chinchilla* fur and used it for coverings and other articles.

In downtown Galveston, Texas, *air conditioning* will be operated as a public utility on a metered service.

First steamship used in Arctic exploration was the British ship *Victory*, which voyaged in the Canadian Arctic with difficulties in 1829.

To make sure that budding scientists in Germany advance no anti-Nazi views, scientific theses written for doctoral degrees must pass the *censor*.

Lemonade was sold as a scurvy remedy by medieval pharmacists in Florence, although not until recently has science understood the vitamin C value of cirtus fruits.

The world's smallest fish has been a *goby* found in one mountain lake in the Philippines—female about half an inch long, male smaller; but a new-found marine goby may be smaller still.

A new melting technique is said to solve the problem of firmly bonding stainless *steel* with ordinary steel, thereby combining value of the former with economy of the latter in making tools and other articles.

Advising that *refugee* physicians establish practice in districts needing doctors, the National Committee for Resettlement of Foreign Physicians says that whole counties in some states are apparently without one resident doctor.

Experiments indicate that *beetles* that spread the Dutch elm disease may be carried considerable distances on the wind.

Europe's second oldest university, the University of *Krakow*, has been closed by German officials, after an unbroken career from 1364.

German toilet *soaps* used to contain about 80% fat, but now not more than 40% is allowed, and materials such as clay and water glass are added.

Buffalo meat will be served to university and college officials from various states when they confer at the University of Oklahoma early in April.

QUESTIONS DISCUSSED IN THIS ISSUE

Most articles which appear in SCIENCE NEWS LETTER *are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article.*

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TECHNOLOGY

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PHYSICS—MEDICINE

High-Speed Centrifuge Tool for Disease Diagnosis

Forces Equal to Eight Million Times Gravity Used To Sort Out Virus Particles According to Weight

FORCES equal to 8,000,000 times gravity that can be created in modern centrifuges have promise of being a new medical tool for the diagnosis of disease, Prof. J. W. Beams of the University of Virginia told the Sigma Xi chapter of the College of Medicine, University of Illinois, in a special Sigma Xi lecture arranged under the auspices of this national honor society for the promotion of research in science.

Keenly noted by the medical faculty and students who heard him was Prof. Beams' statement that ultimately the process of whirling viruses and other medical substances at high speed may become a new means for the accurate diagnosis of disease.

Under the terrific centrifugal forces created in the whirling rotors of modern centrifuges, it has been found that the viruses of tobacco mosaic virus (a plant disease) and the vaccina virus (cowpox used for immunization against smallpox) can readily be separated and purified. He added:

"Interesting differences in the number of sedimenting boundaries, as well as the relative concentration in each, between normal and pathological sera have been found. It is not impossible that the centrifuge may be very useful as a means of determining the correct diagnosis of disease."

Prof. Beams, America's best authority on the construction of ultra high-speed centrifuges, explained that these devices are highly successful in separating out fractions of complex body proteins. These proteins appear to be composed of homogeneous species of molecules which seem to be definite multiples of a fundamental protein mass unit of 17,600.

Prof. Beams cited the Swedish Nobel Prize winning chemist The Svedberg as authority for this concept of 17,600-mass unit as a fundamental building block of protein structure.

The extremely large protein molecules which occur in the bodies of living things represent stable collections of lesser molecules held together in a fragile bond that can easily be changed by many factors including the pH, or acidity, of the medium in which they exist.

A prize example, Prof. Beams discussed, was the coloring pigment of the blood of the common, edible European snail. This pigment, haemocyanin, has the enormous molecular weight of 6,740,000.

When its acidity is changed slightly, Prof. Beams said, "it dissociates by steps into halves, eighths and sixteenths, each dissociation product being a homogeneous molecular species. When the pH (acidity) is changed back to the original value, the components recombine to form the original compound of molecular weight 6,740,000." The ultra high-speed centrifuge is invaluable in determining accurately these large molecular weights.

Other valuable uses of centrifuges, outside the field of physics which designs and creates them, are in the purification of hormones, viruses and the enzymes, and in the determination of the masses of the artificially radioactive isotopes of the elements which are increasingly being used in chemistry, biology and medicine as "tracer" elements to study complex and hitherto-obscure reactions in plants, animals and chemical compounds.

Science News Letter, March 16, 1940

ARCHAEOLOGY—METEOROLOGY

Copper Angel Weathervane Is Rare Gothic Art Treasure

AN ANGEL from fifteenth century Paris is pronounced the most beautiful Gothic figure in this country.

Displayed in a spectacular loan exhibition of medieval art of 1,000 to 1,400 A.D. at Boston Museum of Fine Arts, the copper angel points a stern long forefinger, straight from waist level. Art experts say, however, there is nothing personal in the angel's pointing. Belief is that the image twirled and pointed as a weathervane when it stood on the Sainte Chapelle in Paris.

New England has at least two Angel Gabriel weathervanes, according to WPA's Index of American Design, so the idea of an angel in this scientific role is not entirely new to America.

WIND VANE

This 15th century Paris angel points, not at erring mortals, but at the wind. Originally on the Sainte Chapelle, the weathervane now graces a loan exhibit of Medieval art in America at Boston's Museum of Fine Arts. The Morgan Library in New York owns the angel, rated finest Gothic image in America.

The copper angel has never before left its present home, in the Morgan Library in New York, for public exhibition.

Dr. Georg Swarzenski, of the Boston Museum, who rates the angel the loveliest figure of Gothic art to come to this country, says that in the Middle Ages art and craftsmanship were more intimately connected than in any other age. The most capable artists enjoyed working in metals, wood, leather, or enamel. It was only in the last part of the Middle Ages that movable pictures—so important in modern art—appeared. And then, with rare exceptions, they were made only in Italy.

Pronouncing the exhibition the largest of the period ever arranged in the United States, the Boston Museum states that collectors and museums throughout the country have lent tapestries, sculptures, illuminated manuscripts, paintings, and other objects which once beautified churches and castles. In American collections, medieval art is relatively scarce.

Science News Letter, March 16, 1940

MEDICINE

Transform Cells in Test Tube By Cancer-Causing Chemical

Experiments Indicate That Carcinogenic Chemicals Act Directly on Cells, Independent of General Body Action

PROBING for the secret of how normal healthy cells in a human body are transformed by a chemical into malignant cancer cells, Drs. Wilton R. Earle and Carl Voegtlin, of the National Cancer Institute, U. S. Public Health Service, have achieved the test tube transformation of one type of living cell into what appears as a radically altered type. (*Public Health Reports,* Feb. 23)

Whether their cellular alchemy has created cancer cells out of normal cells remains to be proved. The new cells, however, have at least many of the appearances and characteristics of cancer cells.

This transformation is important scientifically because it is the first time it has ever been accomplished, outside the body, with mammalian cells, such as humans have.

The new type of cells were produced by growing mouse cells in flasks and treating them with methylcholanthrene. This substance is a powerful coal tar chemical which causes cancer when injected into or rubbed on the skins of mice or other laboratory animals. It is similar to the substance in coal tar which causes the kind of human cancer known as chimney sweepers' and spinners' cancer.

Since the cells that were transformed by the chemical were outside the animal's body, the experiments show that the chemical probably causes cancer by direct action on the cells, independent of any general systemic action. In other words the chemical causes cancer by its own contact with the cells and not by indirectly producing changes in general body chemistry which in turn might cause cells to become cancerous.

Significant feature of the transformation of normal mouse cells into this type is the fact that the chief changes so far observed in the cells seem to suggest changes in the cell membrane or envelope. It is suggested that this might be a crucial change in the transformation of a normal cell into a cancerous one by chemical treatment.

Science News Letter, March 16, 1940

MEDICINE

Cancer Conquest May Be Triumph of Machine Age

CANCER, Number Two Killer of mankind, may be mowed down by the mechanical developments of the machine age we are now living in. This picture of the conquest of cancer being added to the annihilation of time and space by man-made machines appears in a review of latest cancer developments announced by the American Society for the Control of Cancer.

The two latest developments in treatment of cancer patients are neutron rays from one of the hugest of machines, the cyclotron, and the refrigeration treatment in which air-conditioning machines are now used to maintain the low temperatures. The verdict of the American Society for the Control of Cancer on the refrigeration or frozen sleep treatment is that cancer pain is temporarily alleviated but that vigorous cancer cells are unlikely to be killed by it.

On neutron ray treatment, the Society's verdict is more hopeful, although it indicates more time is needed to determine the cancer-curing value of this treatment. High speed neutron rays are not expected to give much better results in curing cancer than high voltage X-rays, but there is a possibility of capturing the slow neutron rays and putting them as well as the fast ones to work at destroying a cancer. A recent report of attempts to do this by injecting boric acid into the tumor or cancer, to capture the slow neutrons, makes it appear "probable that some method based on this principle will prove of practical value in treatment of cancer, with high speed neutrons."

X-rays themselves, already serving valiantly as cancer destroyers in some cases, may also be considered a machine age development. Radium, another of the Big Three that are curing cancer today, is a chemical element rather than a machine, but it can truly be called a machine age discovery. Oldest of the Big Three for cancer treatment is the surgeon's knife. Surgery was practised in prehistoric times, but the modern surgeon's healing scalpel is a machine age product.

These machine age developments for cancer conquest are directed toward treatment of cancer patients. For prevention of cancer, scientists have turned to chemistry, genetics, and the study of races, skin color, sunlight and food. Much knowledge has been won, the Society's report indicates, but the twin puzzles of what causes cancer and how it can be prevented have not yet been completely solved.

Science News Letter, March 16, 1940

MEDICINE

Free Cancer Treatment Made More Available

MORE free treatment for cancer sufferers will be available as a result of the reorganization of the American Society for the Control of Cancer.

Teaching people to be on the look-out for cancer signs, and to seek early diagnosis and treatment by one of the three accepted methods, surgery, X-rays and radium, has been the chief job of the Society so far. The time has now come, Dr. C. C. Little, managing director, explained, for the Society to assist people to put its teachings into practise.

Through its reorganization the Society will be in a position to aid indigent patients to get and pay for cancer treatment from accredited physicians. It or its auxiliary body, the Women's Field Army, will also be able to establish and maintain cancer clinics, hospitals, or laboratories. The Society will not, however, treat patients or operate the hospitals or clinics. Its activities will be limited to financing and organizing such institutions.

Science News Letter, March 16, 1940

An *owl* turns its head to stare because its eyes are directed forward.

RADIO

Big-Name Talent May "Freeze" Television Advances

Analogous Situation Held up Phonograph Improvements For Many Years; FCC Urges Caution in Buying Sets Now

DESPITE Federal Communications Commission warning that the new limited-commercial operation of sponsored television programs after next September 1 must not be regarded as any attempt to "freeze" the technical advances of the art, there is some reason to believe that such a "freeze" will nevertheless be accomplished by the television public itself.

Commercial television broadcasting next fall will be on 441-line screen pictures, demonstrated recently to the FCC by the Radio Corporation of America technical staff.

Since that RCA show, the Philco Television Corporation and other smaller companies have been showing television pictures of 605-line screen and better in an attempt to prove that the present is no time to fix standards and freeze on 441-line screen for picture detail.

Here is how the limited commercial television operation next fall may tend to "freeze" television at 441-line screens for an indeterminate length of time, as told to Science Service by a television engineer of one of the smaller independent television companies.

RCA, with its close links with the National Broadcasting Company, would be pretty certain to be able to put on television programs with its great mass of "name," radio talent. These television shows would be good and would catch and hold the television audience because of superior talent. The other, smaller television broadcasting companies would do their best to get good talent, too, but in the last analysis the talent available to RCA ought to be the best. The situation might end up so that television set owners would rather look at some television "Charlie McCarthy" on 441-line pictures than see a lesser known character on 605-line pictures.

It is recalled that in the early days of the phonograph a somewhat similar situation existed which "froze" recording techniques for many years. The original phonograph system of Thomas Edison used vertical—or what is now called "hill and dale"—methods of recording on wax.

The phonograph put out by Victor used lateral, or sidewise, variations for recording. Edison had a good system, but the system which won commercial success was Victor because it hired Caruso and the great names of the musical world to record for it. It was the public's demand for name talent which "froze" technical improvement for years. Only recently has the old Edison system of "hill and dale" come back into prominence, because of its excellent tone fidelity.

This line of reasoning is frankly only speculation at the present time. A final test can be answered only after the coming commercial television programs are on the air and an assay of the television audience reaction can be ascertained.

The FCC, in announcing the new limited commercial television permission, seeks to forestall any such freezing of receiving and transmission systems on 441-line screen detail. The FCC admits that television may be on the threshold of significant technical advances in the art and warns the buying public that only those who can take the financial risk of buying a television set that may shortly be obsolete should take the jump. At the same time the FCC believes that present television is acceptable to the public and that without an actual period of commercial operation the whole question of research on television program material can not be studied.

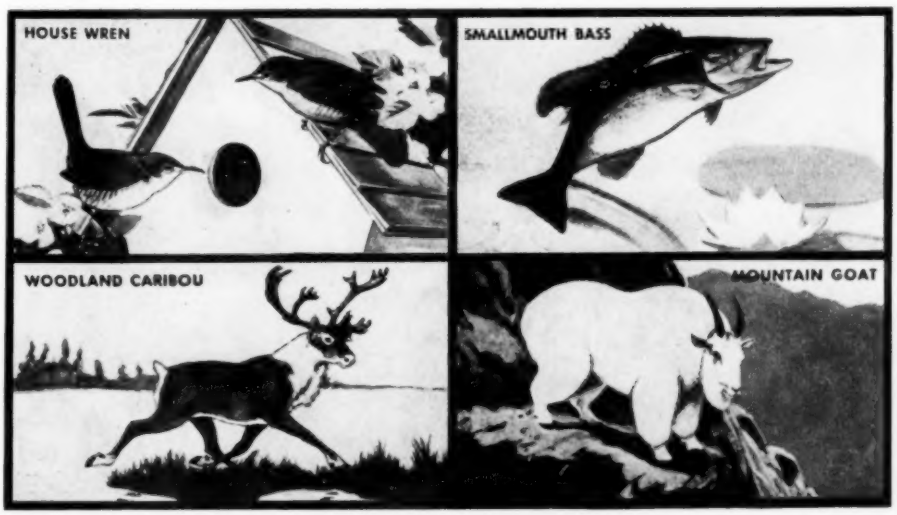
Science News Letter, March 16, 1940

ASTRONOMY—PHYSICS

New Infra-Red Apparatus Will Observe Eclipse

NEW knowledge of the composition of the sun should be secured from observations which will be made during the "ring eclipse" of the sun that will occur on April 7, according to Dr. Otto Struve, professor of astrophysics at the University of Chicago and director of both the new McDonald Observatory on Mt. Locke, Texas, operated jointly by the University of Texas and the University of Chicago, and Chicago's Yerkes Observatory.

Usually a "ring eclipse", in which the moon's diameter is not of apparent sufficient size to obscure completely the sun's disk and produce a total eclipse, is



NEW WILDLIFE STAMPS

"Restore Your Outdoors" is the exhortation borne by each stamp in this year's wildlife series, which is just being placed on sale by the National Wildlife Federation, proceeds to be used in research aimed at the rebuilding of America's once great resources of big and small game, birds, fish, forest trees and wildflowers. Four outstanding designs are reproduced above: wrens, most neighborly of birds; small-mouth bass, favorite of fishermen; woodland caribou, now nearly extinct in this country but hopeful of a comeback; mountain goat, wild and wily dweller of the craggy heights.

of little scientific worth and is regarded more as a pleasing spectacle.

Now being constructed at McDonald Observatory, however, is a new instrument for observing the invisible "infra-red" radiation emitted by the rim of the sun during the ring eclipse. During such an eclipse the much stronger radiation from the center of the sun's disk is blocked out and permits scientists to measure the radiation coming from the rim, or "limb" as it is called. Dr. Struve reports that it is only during a partial or annular (ring) eclipse that this rim radiation can be measured.

McDonald Observatory will be in the zone where the ring eclipse can be seen, but is about 50 miles from best observing position. A special expedition will be sent out to make the infra-red measurements. At the Observatory itself will be mounted the television apparatus invented by Dr. A. M. Skellett of the Bell Telephone Laboratories for observing the corona of the sun during the eclipse.

Science News Letter, March 16, 1940

GENETICS—MEDICINE

Obtain Effects Like Heredity By Transplanting Unborn Mice

"Pseudo-Hybrids" React in Part Like Foster-Mothers, In Part Like Real Mothers, to Tumor-Causing Stimuli

THE POSSIBILITY that some of the effects now attributed to heredity are due to prenatal environmental influence has arisen from cancer experiments in the Roscoe B. Jackson Memorial Laboratory at Bar Harbor, Me., soon to be reported.

Unborn mice that are given foster mothers by transplanting fertilized eggs from one female to another are found to be "pseudo-hybrids" in that they react to transplanted tumors in part as their foster mothers do and in part as their real mothers do. Earlier experiments showed that in the process of nursing, whether the milk is supplied by the real mother or a foster mother, some sort of influence affecting the likelihood of developing breast cancer is transferred. Dr. Arthur M. Cloudman, who conducted the transplantation experiments as a part of a broad investigation of cancer's heredity directed by Dr. C. C. Little, is now planning to conduct experiments to differentiate between the effects transferred during nursing from those acquired during the period before birth.

First announcement of the experiments was made through the American Society for the Control of Cancer.

Science News Letter, March 16, 1940

POPULATION

Million Workers Will Reach Retirement Age by 1950

Even Without Broadening of Present Plan, 1985 Will See Seven Million Included, as Compared With 300,000 Now

THE NUMBER of retired men and women who receive their first crisp old-age Social Security checks during 1940 is only a very small fraction of those who will become eligible for such benefits in the next 45 years. Even if the Act is not broadened in future, probably more than 7,000,000 would be included in the plan as compared with something like 300,000 this year.

Those who earned wage credits in 1937, the first year of the Social Security Act, are relatively few in the older age groups. If you should draw a bar diagram in which the length of each bar represents the percentage of men with 1937 wage credits at a certain age level, you would find it looking like the under side of a stairway with the longest bars at the ages of 20 to 34 and with steadily decreasing steps from there down to the 60 to 64 group where only 27% earned credits. A much smaller percentage of women in the older age groups earned wage credits in that year.

This means that although 1940 will see relatively few persons with wage credits at the retirement age, by forty or forty-five years from now the large group of present young men workers representing from 61% to nearly 64% of the total population at those ages will have reached 65 and the age to apply for old-age benefits. However, all who had 1937 wage credits will not necessarily be eligible for monthly benefits.

No one can estimate exactly just how many will be at the old-age benefit age in 1985, because the actuarial tables on which such predictions are based vary widely. The insurance statisticians who figure such tables like to lean over backwards so as to avoid expensive errors in estimates. Thus, those figuring on survivors to collect annuities conservatively figure on a much smaller future death rate than do those who estimate what must be paid in death benefits.

Robert J. Myers, actuarial mathematician for the Social Security Board, recommends in the "Social Security Bulletin" that the conservative person in figuring costs of such a benefit plan use more than one estimate and plan for costs in a rather wide range.

Using the survival table known to statisticians as the "U. S. White Table," based on experience among the total U. S. population during 1920-29, he estimates that 7,338,000 of those earning 1937 wage credits will be 65 or over in 1985. Using the "Standard Annuity Tables," the number is figured at 10,417,000.

With either table as the basis of calculation, the million mark will be passed by 1950.

Science News Letter, March 16, 1940

The post *oak*, canoe birch and lodge pole pine received their names from their uses.

●RADIO

Dr. W. L. Semon of B. F. Goodrich Company and Dr. J. C. Patrick of Thiokol Corp., will discuss the new rubber-like materials created by chemistry as guest scientists on "Adventures in Science" with Watson Davis, director of Science Service, over the coast to coast network of the Columbia Broadcasting System. Thursday, March 21, 4:15 p. m., EST, 3:15 CST, 2:15 MST, 1:15 PST.

Listen in on your local station. Listen in each Thursday.

STATISTICS

Census Swamped by Requests For Records of Old Age

Old Folks Seeking Pensions Appeal to Bureau By Thousands for Data Establishing Eligibility

THE CENSUS Bureau is fairly swamped these days by letters from worried elderly folks anxiously seeking proof that they are old enough for pensions or social security.

"I've told the Census man my age every 10 years," they write. "Please help me prove how old I am."

Rolling in at the rate of 3,000 to 4,000 a week, these letters are expected to total 200,000 before this year is out. It is a steadily rising stream. Even aided by a new short cut for finding an individual's age record, and even with increased personnel and WPA helpers besides, the Census is hard put to keep up with this new American concern over ages.

By Census limitations, an individual may obtain his own age record from the government—his own, but no one else's. There is no exception to this rule. In one instance, rival heirs besieged the Census Bureau for ages of opponents for use in court. They besieged in vain.

When old age pensions, social security and other provisions for elderly people began to gain nation-wide interest, the Census Bureau foresaw the present situation. Back in 1929, they got only about 4,000 letters in the year from people wanting an official census notification of age, for insurance, getting a job, settling an inheritance, or such purposes. It cost the government two or three dollars to look up a record, but it was the right of the inquirer to ask, and get the answer. Some states started birth registration much later than others. Records from the states were not always available. The family Bible, mainstay of many an age controversy, was sometimes lost or the ink faded. The Census in such cases was the final resort, when people thought of writing there for a record.

To meet the rising tide of inquiries, within the past few years, the Census Bureau arranged for a tremendous WPA project in St. Louis to alphabetize the population of 1900 and work out a cheap and fast method of finding age records. Before that was done, by 5,000 white collar WPA workers in St. Louis, the record had to be hunted according to city blocks. Now, a similar project is undertaken in New York, with the 1920 census, to make the research on age inquiries go as fast as possible. It costs only a few cents now to look up an individual's age.

Science News Letter, March 16, 1940

PHYSIOLOGY

Potassium Thiocyanate Lowers Blood Pressure

HIGH blood pressure, which "kills more people in the United States today than any single disease factor with one or two exceptions," is no longer as hopeless as it has been believed to be, Dr. Paul F. Dickens, George Washington University medical professor, declared at the Post Graduate Clinic.

He based his statement on recent work with a new medicine for reducing high blood pressure which can be used to treat patients in their own homes and will not only keep the blood pressure down but keep the patients free of symptoms for several years to come. This medicine is potassium thiocyanate. Although the medicine has been used for several years, physicians are getting better results with it now because they have learned to base the size of the dose on frequent measurements of the amount of cyanate in the patient's blood.

Papaverine hydrochloride, another relatively new drug, derived from opium, is giving good results in cases of disease of the blood vessels of the heart, brain, arms and legs. There is good hope, Dr. Dickens said, that if this drug is used early, patients with cerebral thrombosis, with paralysis on one side, can be saved from death and their paralysis overcome.

High blood pressure is the greatest killer except cancer and tuberculosis, Dr. Dickens believes, even though mortality records do not show many deaths directly attributed to high blood pressure. The reason, Dr. Dickens explained, is that the deaths are attributed to diseases of the heart, kidneys, thyroid gland, or apoplexy.

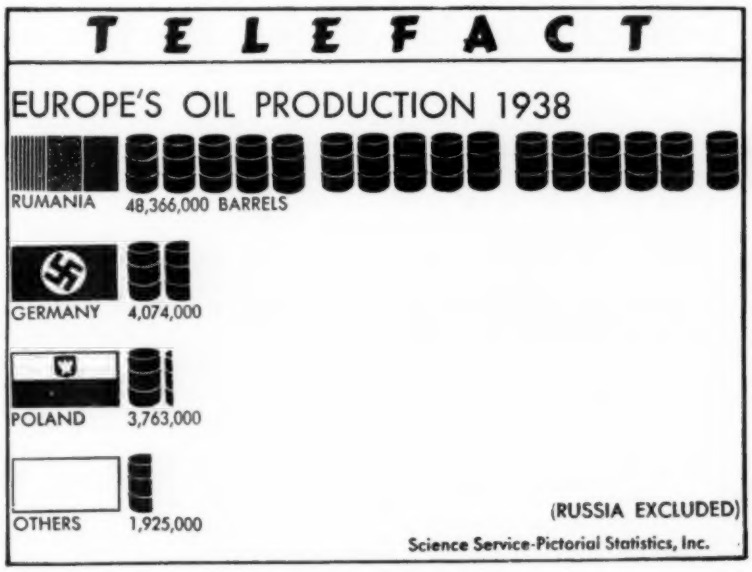
Those who, like Dr. Dickens, have spent years studying the problem of high blood pressure are chagrined at the medical profession for calling it a symptom, he declared.

"Anyone with high blood pressure has a race going on in his body between whether he will die of apoplexy, kidney disease or heart failure. The race is usually won by heart failure," Dr. Dickens said.

Science News Letter, March 16, 1940

An *airplane* has been chartered by Moslem pilgrims in East Africa, to cross the Red Sea en route to Mecca.

Describing *amber* as "German gold," Germany is popularizing amber jewelry and novelties to stimulate the industry.



PALEONTOLOGY

Six-Horned Beasts Sought in South Dakota

SIX-HORNED beasts that lived in South Dakota 30,000,000 years ago will be sought in the Dakota badlands during the coming field season by a joint expedition of the National Geographic Society and the South Dakota State School of Mines.

The animals, known as protoceras, were not giants. They were only about the size of sheep, and they were remotely related to deer and antelope. In addition to the six horns or knobs that adorned his head, the male also had a pair of slender tusks.

The expedition will also hunt for the bones of titanotheres, which were rhinoceros-like animals as tall as elephants.

President Joseph P. Connolly of the School of Mines will be in charge of the researches, assisted by James D. Bump, curator of the School's museum.

Science News Letter, March 16, 1940

ARCHAEOLOGY

Oldest Steel Weapon Was Made About 1500 B.C.

THE WORLD'S oldest steel weapon, a battle-axe made by expert munitions makers of about 1500 B.C., has been unearthed in Syria by the French Archaeological Expedition to Ras Shamra.

Praising technical skill of the makers, Dr. Claude F. A. Schaefier, director of the expedition, attributes the battle-axe to Mitannians from the Euphrates region, who were outstanding militarists of their time.

The axe blade is of iron put through steel-making processes, he explains. Long before modern steel puddlers began to melt iron to harden it by sudden cooling, it appears that the ancient Near East achieved a primitive kind of steel by shaping the iron blade, then heating and plunging it into cold water.

Fastening the iron axe blade to the handle was a beautifully ornamented bronze socket. Two lion heads and a wild boar, cleverly designed, are the decorations. The socket was shrunk on to the blade, so that no rivets were needed.

Mittanians are credited with great skill in horse breeding, and their handling of horse-drawn chariots in war was one of the "modern" developments of fighting in their age.

When found by Dr. Schaeffer, the axe was in a sanctuary in the ruins at Ras Shamra. Military officers worshipped there, he infers, since the adjoining building was a great riding hall and communicating with that was a fine stable. In ashes that covered the ruins, were discovered many arrows and pieces of armor, indicating that the building served also as an arsenal for chariots.

Ras Shamra, in northern Syria, was the ancient city known as Ugarit. Since 1928, when a Syrian peasant dug his way into a vaulted tomb containing gold objects, the French National Museums have sent nine expeditions to dig at the site. Inscriptions of great importance, including some in a new script, are among revelations from the site. Deciphering them, scholars now have evidence of the lost Canaanite literature, which explains the origin of many ideas and customs of Hebrews in the Bible.

Science News Letter, March 16, 1940

PHYSICS—MEDICINE

Radioactive Indium Metal May Have Medical Uses

THREE new forms of artificially radioactive indium, created by bombarding the rare metal with high-voltage X-rays, have been manufactured by a Massachusetts Institute of Technology research group.

The discovery, reported to the American Physical Society, confirmed the findings of Notre Dame physicists that high-voltage X-rays would produce radioactivity. The artificially activated indium made in that experiment had a half-life of four hours but M.I.T. scientists have uncovered a whole range of activities, from one with a half-life of 4 hours to one with a half-life period of only 12 seconds.

Substances with short half-life periods are expected to be very valuable in the medical applications of these substances.

The report was an unprogramed supplement to a scientific paper on the high-voltage production of positive ion and electron beams with the M.I.T. giant electrostatic generator. The research was done by Dr. Robert J. Van de Graaff, Dr. Lester C. Van Atta, Dr. Chester M. Van Atta and Doyle L. Northrup.

Evidence of the new activities was detected with the generator operating at a little under 1,000,000 volts, considerably lower than had been expected, and the yield mounted rapidly as the voltage was increased.

Indium is a rare metal with properties similar to aluminum. It is silver-white in color, softer than lead and about the same weight as tin. It is found chiefly in zinc sulphide or zinc blende ores.

Science News Letter, March 16, 1940

IN SCIENCE

ORNITHOLOGY

Imperial Penguin Comes to National Zoological Park

See Front Cover

FIRST of its kind to arrive in the United States, an imperial penguin, one of the largest and most dignified of penguin species, has been received at the National Zoological Park in Washington, D. C., and is shown on the cover of this week's SCIENCE NEWS LETTER.

It was captured in Antarctica by Malcolm Davis of the "Zoo" staff, now with the Byrd expedition, and photographed by Fremont Davis, Science Service staff photographer.

Sex of the newcomer has not been determined, since male and female emperor penguins are exactly alike in external appearance.

Science News Letter, March 16, 1940

ENGINEERING

Blotting Paper Principle Makes Harder Concrete

THE U. S. Reclamation Bureau engineers have perfected a new, inexpensive method of hardening concrete surfaces, which compacts the concrete and avoids the forming of "voids" within it. They use "blotting" paper.

To improve the surface of the spillways of its giant dams, over which billions of gallons of water glide yearly, government engineers tried a highly absorbent wall fiber board, similar to the board you use in your home, except that it is even more absorbent. They found the paper, unrolled on the spillway concrete while it was still soft, drew out excess moisture and allowed air bubbles to escape from the drying mixture. There is a double-action effect. The concrete dries evenly, the fiber board remaining moist and protecting the surface.

The resulting spillway surfaces were satin-smooth. Tests indicated that the concrete was unusually hard and wear-resistant.

The new process was reported by C. O. Crane, assistant engineer of the Bureau, to the Colorado Engineers' Society.

Science News Letter, March 16, 1940

NCE FIELDS

MEDICINE

Blood Grouping Shown On German Soldiers' Tags

EVERY German soldier has a new mark on his identification tag, around his neck, for use in case he becomes a casualty. In addition to name and outfit identification, the metal tag shows the soldier's blood group, saving valuable time in case a hurry-up blood transfusion is needed. Blood from a donor or bottled crimson fluid from a blood bank can thus be transfused without stopping to type the wounded man's blood. This information is from Berlin via American Medical Association. The Japanese army already does this.

Science News Letter, March 16, 1940

ARCHAEOLOGY

Pharaoh Psousennes Found In Gold Trappings

DISCOVERY of a 3,000-year-old Pharaoh shining in regal gold, announced by Prof. Pierre Montet of the University of Strasbourg, brings a new figure into the limelight, and into the ranks of Egypt's kingly mummies.

Little known to history, Psousennes I ruled during a troubled dynastic era, about 1000 B.C. Egypt's prestige abroad was low. Within the country, robbers had so persistently plundered tombs of Egypt's kings and queens at Thebes cemetery, that the living rulers had a serious problem to move the kings about to safer tombs. Eventually, many royal refugee mummies found a hiding place in the temple of Deir el Bahri at Thebes cemetery, and there a motley gathering of kings remained, some in their own coffins, some in borrowed trappings, until modern discoverers brought them to light in 1881. They have since been moved into what is coming to be the traditional resting place of Egyptian kingly mummies in our time—the Cairo Museum.

Psousennes and other kings of the tenth and eleventh centuries B.C., who saw the plundered wreckage of their predecessors' tombs, were themselves more fortunate. At least, so it appears from Prof. Montet's success thus far in finding tombs of the twenty-first and twenty-second dynasties in the Egyptian Delta. Shishak, whose gold and silver coffins were found by Prof. Montet just a year ago, lay undisturbed in his tomb, by the fortunate chance that a solid wall hid the place. Shishak and his treasures have joined the assembly in the Cairo Museum, greatest conclave of dead royalty anywhere on earth. And now comes Psousennes, whose career will be better understood when Prof. Montet has read inscriptions in his tomb.

Science News Letter, March 16, 1940

MEDICINE

Cold Blood Can be Used Safely in Transfusions

COLD blood from blood banks may safely be used for transfusions without previous heating, Drs. Elmer L. DeGowin, John E. Harris and E. D. Plass, of the State University of Iowa College of Medicine, announce. (*Journal, American Medical Association,* March 9)

"Economic pressure in the United States" and "military necessity in Europe" have stimulated interest in these banks of preserved blood for human transfusions, they point out.

The use of cold blood, at temperatures between 59 and 77 degrees Fahrenheit, without first warming it to body temperature of 98 degrees Fahrenheit, saves time and money in transfusions and avoids the danger of getting the blood too warm during the preheating. Cold blood does not significantly lower the patient's temperature nor does it cause consistent change in blood pressure or other untoward clinical symptoms.

The effect of storage on the blood was also studied by the Iowa investigators. They make it a rule, as a result of their studies, to discard citrated blood after 10 days of storage, and to discard blood in a dextrose-citrate mixture after 30 days.

For military purposes, when preserved blood for transfusion must be transported considerable distances, the studies show that the dextrose-citrate mixture is the preservative of choice and that the blood should be kept in flasks containing no air. These two measures help to prevent damage to the red blood cells by shaking of the blood in transportation. Rubber stoppers, a great advantage over cotton plugs from the standpoint of facilitating transportation, are as good as the cotton plugs for preserving the blood.

Science News Letter, March 16, 1940

PHILATELY

Scientists on New Stamps May Stir Contention

UPON new U. S. postage stamps there are appearing this year portraits of 35 intellectual leaders of America, five artists, five authors, five composers, five inventors and five scientists.

This recognition upon our stamps of other than military and political leaders will meet, in principle, with general approval. And it will not cost the government money because collectors buy stamps by the thousands that are never used for postage.

Whether the right five in each group has been picked is another question. Most lack of agreement with the P. O. Department's selection is likely to be expressed in connection with the selection of scientists: Luther Burbank, Dr. Crawford W. Long, Dr. Walter Reed, John James Audubon and Jane Addams.

Dr. Reed, who demonstrated the transmission of yellow fever by the mosquito, will meet with universal approval in science circles. Audubon, the pioneer American naturalist and gifted portrait painter of birds, will too win approval. Jane Addams, great humanitarian, is hardly considered a scientist in the strict sense. For great welfare workers why not a special series to do them honor?

Selection of Dr. Long revives the controversy as to who deserves the credit for ether anesthesia, this Georgia village doctor or William T. G. Morton, Boston dentist. Long was chronologically first, but the use of ether for operations spread from the Boston focus. Why not honor both with stamps?

Most controversy will be caused by the face of Burbank upon a stamp. He is rated a great gardener rather than a great botanist.

Scientists by the dozen have equal reason for being honored on our stamps. Joseph Henry, who ranks with Faraday as the father of the electrical industry; Benjamin Rush, early physician of Philadelphia; Josiah Willard Gibbs, founder of thermodynamics; Simon Newcomb, the astronomer; Asa Gray, the botanist; Benjamin Silliman, early Yale chemist; Joseph Leidy, E. D. Cope and Othniel Charles Marsh, great explorers of ancient and living animals; Dr. William H. Welch, great pioneer in medicine.

Two great scientists and a great agriculturalist, already honored with stamps, may be claimed by science: Benjamin Franklin, Thomas Jefferson and George Washington.

Science News Letter, March 16, 1940

TECHNOLOGY

Research Brings New Advances In the Field of Packaging

Pickles in Plastic "Bottles"; Shoe Shine Outfits That Do Not Smear Hands; Medicated Wound Dressings

By WATSON DAVIS

PICKLES and juice packaged in a plastic "bottle" made of a bag of transparent film. A new kind of collapsible tube, opened by a dig of the thumbnail, containing a medical dressing soaked in liquid ready for application to burns. Coffee vacuum-packed in paper-plastic bags. Buttons fixed between transparent films instead of being sewed on cards. A vacuum valve can for vegetables that allows them to be cooked thoroughly in only 30 seconds. A shoe shine outfit that squirts the polish from a tube directly into the brush, keeping the hands clean.

These, and 30,000 other new packages were placed on the shelves of American stores during the past year as a result of the cooperation of scientists and designers with American industry.

It's a far cry from the old-fashioned cracker and sugar barrel, symbolic of the primitive days of unpackaged merchandise, to the modern containers being displayed in New York as a result of the current All-American Package Competition.

Most striking is the use of transparent sheeting, made from rubber and synthetic resins, allowing the prospective customer to see what he is buying.

Brine in Package

Pickles swimming in their own brine within a flexible and almost invisible combinaton film of rubber and cellulose aectate sheeting, capable of being handled roughly without danger of spilling, is perhaps the most novel package in the display. Less expensive than the conventional glass bottles, the new transparent pickle bags are expected to decrease the cost of distributing this food product to the housewife. Olives, too, will soon appear in bags of transparent film.

In the frozen food field a new method of applying transparent rubber sheeting offers a means of eliminating freezer burn and allows for a seamless sealed container for quick frozen food and other products.

Science's ability to make transparent plastic sheeting that is both air and waterproof is making it possible to package in plastic bags coffee and other products that need protection against the atmosphere.

The new type of tin can for food, made with a one-way pressure valve in its top, not only will allow speedier production of canned food by the cannery but, according to claims, retains a more delicious flavor in the contents of the can.

Boxes for Display

Cardboard or fiber board is replacing wood to a large extent in the manufacture of the larger containers such as for bicycles and apples. One manufacturer of bicycles has adopted a container that does not contain a single nail or piece of wood. It is opened with a knife instead of a hammer. Apples and other fruits are being merchandised in fiber board containers, easier to open, and often so decorated that they can be used as displays in stores. In another case a gridiron is packed in a fiber board container lithographed to imitate a popular brand of expensive airplane weight luggage.

A button manufacturer developed a new card for displaying and distributing buttons because it was cheaper than the conventional methods of sewing to the cards. A sheet of transparent material made from rubber, heat pressed between two pieces of card, holds the buttons securely in place. Buttons are removed by breaking the film with a fingernail.

"Laboratory researches of the depression years are responsible for the revolutionary new types of packages, package materials and packaging processes which are now appearing on the market," it is declared by Charles A. Breskin, publisher of *Modern Packaging Magazine*, which sponsors the All-America Package Competition.

Cheese is being marketed by some 90 per cent. of the American cheese industry in transparent heat-sealed bags, into which the cheese is poured as a hot, gummy fluid and in which it hardens in brick form.

PACKAGED LIQUID

Pickles packed in plastic "bottles," one of the newest advances in the packaging field, are shown.

A new aluminum coated steel can, called by its inventors the "metal bottle," is being used for beer. A drawing process completely eliminates top and side seams.

Ice cream has its first factory-sealed package, which can be opened by pulling a string inserted around the center of the fiber can.

Lard is dished out by the cook in the kitchen without waste and handling of greasy paper in a new square carton.

Ruffling, trimming, and even blankets have new transparent plastic containers.

Places for Old Razor Blades

A novel razor blade package pops out a new blade at the press of a finger and provides at the same time a receptacle for used blades.

An ingenious use of small screw top jars with their lids affixed to a revolving support, provides a new way of displaying and dispensing everything from nails to spices on hardware and grocery store counters or in the home or workbench and kitchen cabinet.

Perfume, cleaning fluids and other liquids are dispensed by a little rubber pump set in the top of a bottle cap.

For shippers of metallic merchandise and particularly exporters of water-borne goods, science has developed a technique whereby a moisture absorbing material is used to minimize the humidity con-

tent of the shipping container, thus eliminating mold and rust formations.

Plastic transparent bags are invading the domain of the tin can for processing and packaging food products. The blanched vegetables and other prepared foods are placed in a transparent envelope which is heatsealed and placed in cooking chambers where it is subjected to high temperatures and pressures. After the sterilization, the bags are removed and placed in printed folding boxes, wrapped in transparent cellulose when they are ready for merchandising.

The claim of the packaging expert is that due to the new kinds of containers packaged goods can be sold at as low a price as the old-fashioned unpackaged materials that sat around in barrels in the grocery store. The consumer is given the advantages of sanitary handling, uniform quality, regulated size and weight, often at a lower cost, as a by-product of new invention and design in the packaging industry.

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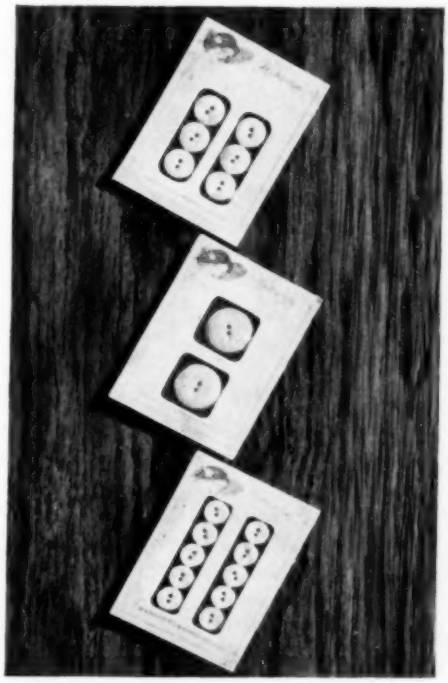
Danish fishermen have been warned not to use their radio senders in mine infested waters, because such senders have been known to induce electrical currents strong enough to explode mines.



NEW STYLE

No longer are buttons sewn on display cards. These are fastened on cards with layers of transparent Pliofilm and can be removed individually.

FOR CLEAN HANDS

Here is the latest trick in shoe polish. Squeeze the tube and the paste comes out through the brush so that it can be applied without smearing the fingers.

METALLURGY

Molten Metal Formed Continuously Into Rods

LATEST to join the increasing number of technologic processes to be performed continuously, instead of intermittently, is the casting of rods and tubes from molten metal.

After a relatively long period of development, continuous casting is applicable in principle to all metals and alloys, although most of the work has thus far been done on copper.

The equipment and process themselves are fundamentally simple, as described by an industrial bulletin issued by Arthur D. Little, Inc. The molten metal flows from a reservoir out of a water-cooled tube at the bottom. As the metal flows down the tube it solidifies into a rod, which is cooled by an accurately adjusted spray as it is continuously withdrawn. Exact control over all these operations is necessary for successful operation. The flowing metal always solidifies at the same point of the exit tube, and each part of the rod is formed under the same conditions.

Higher quality of product is promised by the new process. There is no chance for components of alloys to segregate out, air and other gases in the molten metal are not trapped in the solid metal, producing flaws, and the crystals into which the solidifying metal forms are large.

Due to high quality, the use of continuously-cast rods, instead of the usual ingots, is foreseen as the raw material from which wire is drawn.

Science News Letter, March 16, 1940

More than 31,000,000 pine seedlings have been planted by land owners in Florida in the past 12 years.

PSYCHOLOGY

Military Training in College Fails to Change Attitudes

Upper Classmen Registering for Advanced Military Courses As Opposed to War as Classmates Who Do Not Volunteer

This authoritative article is prepared by the Society for the Psychological Study of Social Issues especially for release through Science Service. It is one of a number of announcements of current research on war and propaganda.

MILITARY training does not make students war-minded, it is revealed by a three-year study of the attitudes of 587 college students toward war. Dr. George J. Dudycha, professor at Ripon College, concludes from his survey that compulsory military training for college men apparently has little effect on their attitudes either toward or against war.

Moderately or strongly opposed to war are the majority of students whose attitudes were measured by Dr. Dudycha. Only a few, 5.6%, were moderately favorable and none were strongly favorable toward war. Women tended to be more opposed to war than men, but they seem to become somewhat less opposed as they pass through four years of college.

Those junior and senior men who voluntarily elected to pursue the advanced courses in military science continued, for the most part, to be moderately or strongly opposed to war. When these men taking advanced work in military science were compared with those who did not continue this course, little difference between the two groups was discovered. There were only approximately 5% more men opposed to war among those not continuing courses in military science than among those who did. In general, this study indicates that those men who take four years of military science in college do not materially change their attitude toward war and that those who do not take advanced military science become slightly more opposed to war as they pass through college.

"These results," Dr. Dudycha observes, "probably are unsatisfactory to both militarists and pacifists. People who favor compulsory military training often claim that knowledge of military training leads to an abhorrence of war. Those who are unalterably opposed to such training, on the other hand, argue that this knowledge leads students to be more war-minded. Neither point of view is supported by the results that have been obtained. Consequently the issue of compulsory military training in American colleges should be decided on other grounds than its supposed effect on students' attitudes toward war."

Science News Letter, March 16, 1940

ARCHAEOLOGY

Was St. Patrick First Archaeologist in Ireland?

SAINT PATRICK, born about 389 A.D., was Ireland's first archaeologist. So it appears from a picturesque bit of digging recorded in his life story and all but forgotten by modern archaeologists.

Coming upon a huge grave 120 feet long, the saint had it opened, and then, the story goes, he did something that every archaeologist yearns to do; he brought the dead man to life temporarily and interviewed him, learning that the man's name was Cass, he was a king's swineherd, and was slain by soldiers 100 years before.

Leaving aside miraculous angles of the incident told by the biographer, what St. Patrick opened was evidently one of Ireland's Long Barrows, or mounds of earth which prehistoric folk were accustomed to heap over large graves.

In the tale, St. Patrick's concern with the race and antiquity of the mound's occupant was that of a missionary, bent on baptizing any pagan. Still, if the saint did take any interest in a Long Barrow and its age, he belongs in Ireland's archaeological past.

Modern archaeologists are learning about Long Barrow makers by the hard, slow process of examining the mounds and each scrap of evidence inside. The people are revealed as an early migration wave into the British Isles, coming about 3500 B.C. from the continent, and bringing a Stone Age culture. When new immigrants who knew use of bronze arrived about 2100 B.C., the two groups blended.

Science News Letter, March 16, 1940

GENERAL SCIENCE

Science Attaché Proposed For Embassy in London

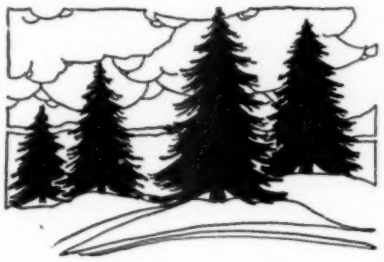
A SCIENTIFIC attaché has been proposed as a permanent addition to the French embassy in London, to function for interchange of scientific ideas between the two countries very much as the military attaché already functions in collaboration for defense. The usefulness of such a scientific envoy would not cease with the ending of the present war, but would continue and be greatly augmented after the coming of peace.

An important group of French men of science, headed by Dr. Paul Langevin, distinguished physicist, professor at the College de France and Director of the Paris École de Physique et de Chimie, has just completed a visit of scientific laboratories in Cambridge and in London. A meeting of the Royal Society was specially arranged to enable the French visitors to take part in its deliberation and to confer upon Prof. Langevin the distinction of Foreign Member.

Science News Letter, March 16, 1940

BOTANY

NATURE RAMBLINGS
by Frank Thone



Cambium

CAMBIUM is a word we see fairly often in technical and semi-technical writings, yet unless we are botanists it may be difficult for us to get a real idea of its tremendous significance.

If it were not for cambium, you would not be reading these printed words, you would not be sitting on your chair before a wooden desk or table, you might be shelterless, perhaps even partly naked.

For cambium is the stuff that makes wood, and it is out of wood that this paper, chair and desk are made, wood that enters importantly into the construction of all but the most fireproof of buildings, wood that is the ultimate raw material of most of the rayon we wear.

Cambium is a thin layer of living cells between the bark and the wood of the tree. It may be only one cell thick—at most never more than four or five cells. It sheathes the trunk of the tree and all its branches, out to the ultimate, slenderest twig. It is responsible for all growth in thickness of all trees except palms, tree yuccas, bamboos, and a few strange forms of that kind. All the more familiar sorts—oaks and elms and maples, pines and firs and spruces, owe their mighty trunks and their wide-spreading branches to cambium.

It is a continuous inner garment of the woody part of the tree, woven without seam from the top throughout. It forms a cylinder around the trunk, and divides into smaller cylinders around the branches, as the fingers of a glove divide out from its hand and wrist.

The way it forms new wood and bark is quite simple. Each cell divides on its inner and outer sides, always practically at the same time as all its neighbor cells, and usually forming new cells of about the same size. These subsequently thicken and harden to wood elements on the inside, into bark on the outside.

In spring, when water is plentiful and growth conditions are generally favorable, the cambium cells swell up large and the new cells they form are likewise large. They form wood cells and vessels with large cavities and thin walls. Later, growth slows down, the cambium cells are smaller, and the cells they form are likewise smaller and have thicker walls. It is this difference between spring and summer growth that makes the alternation between dark and light zones in each annual ring in the wood.

Science News Letter, March 16, 1940

ENGINEERING

Develop New Dustless Copper To Reduce Short Circuits

A NEW type of dustless and sliverless surfaced copper, perfected after 10 years' research and over $1,000,000 expenditure, was announced by Wylie Brown, president of Phelps Dodge Copper Products Corporation.

The new copper, known as "PDCP", is developed to meet the needs of the electrical industry for a metal free of the imperfections of ordinary copper which now are responsible for the penetration of insulation and for a large percentage of electrical failures through short circuit.

Made without melting from electrolytic cathode copper, the metal is plastically converted under tremendous pressure in a reducing atmosphere at elevated temperatures into smooth dense copper bar, rod, strip, or other desired commercial shape. Basically oxygen-free type is declared to be the only solid copper in the world not melted subsequent to the electrolytic purification process. Vibration and magnetic stress in copper windings in motors and transformers eventually cause ordinary copper imperfections to penetrate insulation.

The greater ductility than ordinary copper permits sharper bends and easier forming and drawing, and the new metal approaches the malleability of gold and has greater conducting power for electricity. Among successful applications are: High frequency and high voltage transformer windings, high tension and submarine cables, refrigeration and air conditioning installations, airplane and electric locomotive wiring, and railway signal bond cable.

The new patented method eliminates both the casting process and hot rolling. A new manufacturing unit was constructed at the Bayway Mills of the Phelps Dodge Copper Products Corporation at Bayway, N. J., for the exclusive production of the new kind of metal.

Science News Letter, March 16, 1940

A fox is a member of the canine family but its eyes are like those of a cat.

ENGINEERING

New Method Pumps Oil Down, Not Up, Through Sand

Ordinary Soap Flakes Make Radical Change in Capacity of Limestone to Transmit Oil; Other Compounds Successful

A NOVEL method of drilling and pumping oil wells—pumping the oil so that it goes down instead of up through oil-bearing sands—was recently described at the meeting of the American Institute of Mining and Metallurgical Engineers in New York. The new method, studied and worked out in the laboratory, will perhaps solve a difficulty confronting oil men everywhere; what to do with a well of the "marginal" variety that is pumping about 90% water and only 10% oil.

Two university scientists, Prof. F. B. Plummer of the University of Texas and H. K. Livingston of the University of Chicago, announced the new results, which may be regarded as laboratory signposts pointing to a more efficient drilling and pumping of the nation's petroleum resources.

Making experimental counterparts of oil fields and pumps, the scientists found:

1. That ordinary upward pumping creates a "cone" of water about the well which often shuts out the flow of oil in the oil-bearing sands.

2. That detergent chemicals—in some cases merely soap flakes—can reduce the surface tension forces on the water so that it is not pulled through the sands so easily by capillary attraction.

3. That downward pumping of the well—so that the flow of oil in oil-bearing strata was downward instead of up—tends to prevent the formation of the water cone which previously excluded the oil.

In one test, where the experimental oil and water mixture was passed through limestone, it was found that 5% oil and 95% water was coming through. Then a very small dose of soap flakes of a popular variety was added to the oil-water mixture. This changed the ability of the limestone to transmit water so much that quickly the laboratory "well" was pumping 68% oil and only 32% water.

Soap flakes would not work for all waters encountered in typical oil well fields but where it failed other chemicals such as Aerosol OT, Igepon AP/1 and phenol worked successfully.

Drilling oil wells so that the oil is pumped downward instead of upward was explained by the scientists:

"The wells are drilled below the level of the producing sand, cased, and cemented. The casing is perforated with a few small perforations at the top of the sand. The well is pumped in such a way that the fluid level in the casing does not reach the level of the oil sand. In this way, the water, if any comes through with the oil, does not come in contact with the producing face of the oil sand above the level of the cones."

Science News Letter, March 16, 1940

MEDICINE

Synthetic Gland Extract Prevents Surgical Shock

SAFER surgical operations and speedier recovery from them, especially for debilitated patients, seem promised by a new treatment for preventing dangerous shock during and after operations. The treatment, using a synthetic adrenal gland hormone, was developed by Dr. David Perla, of Montefiore Hospital, New York.

"Striking benefits" in 14 cases at this hospital are reported by Dr. Perla, who said that the treatment will shortly be adopted in two other New York City hospitals.

The patients treated at Montefiore were what would be considered poor surgical risks because serious chronic illnesses such as cancer and tuberculosis had weakened them so that they would have little strength to withstand an operation. Without the new treatement, patients of this type might have had to forego the chance of being helped by surgery because the shock of the operation might cause fatal prostration and collapse.

With the new treatment, patients are prepared for operation by being given quantities of salt solution and carefully prepared doses of desoxycorticosterone acetate. This chemical is the synthetic vital hormone of the adrenal glands. Earlier studies have shown that these glands play a significant role in the body's fight against intoxications, poisons, shock and infections. The adrenal cortical hormone, Dr. Perla explained, influences the transfer of water from tissues to cells and the level of salt in tissues and cells. Disturbance of this glandular balance, which frequently occurs in an exhausting operation, leads to collapse.

"In all instances the patients were strikingly benefitted," Dr. Perla said in his report of the new treatment. "There was no objective evidence of shock. The blood pressure was maintained or elevated. The temperature in general returned to normal within 24 to 48 hours. Post-operative exhaustion and toxemia were definitely lessened. Complications did not occur. Operative recovery seemed to the surgeons concerned to be more rapid than in their preceding surgical experience in our hospital."

Science News Letter, March 16, 1940

PHYSICS

Device Tells Temperature Of Objects at a Distance

Jug of Melting Ice and Five-Gallon Can of Live Steam Used As Comparison Objects in Operation of New Pyrometer

A NEW kind of remote acting thermometer, that can measure the temperature of distant objects without ever going near them, has been developed by Dr. John Strong, physicist of California Institute of Technology.

The new device is a pyrometer. This name is a misnomer, in part, for ordinary pyrometers are commonly used only for measurements of temperatures of extremely hot objects such as the molten metal of an open hearth furnace in a steel mill.

As a metal gets hotter and hotter, it turns to dull red, bright red and finally virtually white in color. An ordinary pyrometer uses this change of radiation wavelength (for that is what the different colors mean) to determine temperature.

Dr. Strong's new instrument simply applies this same trick for invisible radiation wavelengths in the very far infra-red region of the spectrum. His pyrometer is useful in the temperature range from minus 100 degrees Centigrade to the temperature of boiling water, with an accuracy of 0.1 degree Centigrade.

To measure temperatures with the new pyrometer a small telescope attached to the device is pointed into the wide-mouthed neck of a jug of melting, cracked ice. This gives a reading on the scale of the instrument corresponding to a temperature of zero degrees Centigrade.

Next the telescope is pointed at an opening in an ordinary five gallon oil can containing live steam. The reading on the instrument is noted for this known temperature of 100 degrees Centigrade. Finally the object, whose temperature is to be measured, is picked up in the telescope and it produces a given reading on the instrument.

Knowing the two fixed temperature point readings (melting ice and steam at 100 degrees) one needs only to look on a conversion chart at the point observed by the instrument for the given object and its temperature can be read off.

In principle the new pyrometer is an infra-red spectrometer which—by means of a grating and multiple reflections off suitable crystal surfaces—picks out the single infra-red radiation wavelength of 8.8 mu. (1,000 mu corresponds to wavelengths one millimeter long). The emission of this particular wavelength in the infra-red region by the ice, the steam and the object whose temperature is being measured, is used and correlated into a final temperature reading.

Important applications await the new instrument. It can be applied for temperature measurements on objects that are inaccessible for ordinary thermometer devices.

It can be used, too, in meteorology to make determinations of the water vapor content of the atmosphere. In astronomical and terrestrial physics new uses are being studied.

Science News Letter, March 16, 1940

PSYCHIATRY

Brain Operations Found to Aid Some Hopeless Mental Patients

NEW types of brain operations, in which parts of the brain's frontal lobes are removed, are causing astounding recoveries of cheerfulness and ability to cope with the problems of everyday living for some types of mental patients, Dr. J. F. Fulton of the Yale University School of Medicine told the Sigma Xi chapter of the Mayo Clinic.

Speaking on the functions of the brain's frontal lobes, Dr. Fulton said that the new surgical methods are being studied clinically and compared with the results secured by the severe "shocks" now given to some mental patients to lift them out of their mental state. Insulin and the drug metrazol have been tried for such shock treatment of the insane.

Dr. Fulton did not discuss the astounding change in personality for some patients following such operations, but one of the most amazing on record is the case of an unsuccessful stock broker who became a millionaire in a short while following the removal of a portion of the frontal part of his brain, where a tumor was present.

The ex-stock broker became a salesman and his success was so phenomenal that in a few weeks his company had to enlarge its plant to take care of his orders. Soon he was made a vice-president and is now in the millionaire class.

Such brain operations are made only as a last resort to save a patient's life or mentality.

From studies on animals and man, Dr. Fulton said in his address, scientists are now making great progress in what may be called the geography of the brain; a knowledge of what regions control what functions.

Just as the young of animals, including men, tend to repeat the whole forward cycle of their evolutionary background, it has now been found that the neurological processes of young animals also tend to exhibit throwbacks to their evolutionary ancestors.

Science News Letter, March 16, 1940

When the 1930 census was taken, the United States had 93 cities of more than 100,000 population.

First Glances at New Books

MEDICINE—EDUCATION

MEDICAL EDUCATION IN THE UNITED STATES, 1934-1939—Herman G. Weiskotten, Alphonse M. Schwitalla, William D. Cutter and Hamilton H. Anderson—*Amer. Med. Assn.*, 259 p., $1. A generally cheerful picture of the state of medical education in the United States and Canada appears in this report of a survey conducted by the American Medical Association. Improvements made at the cost of increased budgets even during the depression years are noted. The ranking of the various schools is not given, the report concerning itself with objectives and ideals in medical education and the way these are being met. Even the weakest of the schools at the time of this survey, it is stated, was a stable institution compared with the numerous proprietary schools and diploma mills in existence during the period 1905-1910 when the A.M.A. council on medical education started its work.

Science News Letter, March 16, 1940

PHILOSOPHY

JOURNAL OF THE HISTORY OF IDEAS. Vol. 1, No. 1, January, 1940; Quarterly —Arthur O. Lovejoy, editor—*Pub. at N. Queen St. and McGovern Ave., Lancaster, Pa.*, $4. per year. A new philosophical quarterly, the contents of the initial number ranging from a discussion of Polybius and the American Constitution, by Gilbert Chinard, to a brief article on Copernicus and Mechanics, by Edgar Zilsel. The editor is a well-known member of the Johns Hopkins faculty.

Science News Letter, March 16, 1940

BIOLOGY

BIOLOGICAL DRAWINGS, WITH NOTES—Maud Jepson—*Chemical Pub. Co.*, 60 p.; Part I, $1, Part II, $1, Parts I & II, $2 (bound together). Beautifully executed outline drawings illustrating work done in elementary biology courses, for the assistance of students—and, it is to be hoped, their encouragement to go and do in like manner.

Science News Letter, March 16, 1940

PHYSICS

M. K. S. UNITS AND DIMENSIONS AND A PROPOSED M. K. O. S. SYSTEM—G. E. M. Jauncey and A. S. Langsdorf—*Macmillan*, 62 p., $1. In January, 1940, the international world of physical science adopted the meter, the kilogram and the second (MKS) as the basic units of length, mass and time. The suggestion had been proposed in June 1935 at international conferences at Brussels. This little book explains for electrical engineers, physicists and teachers the properties of the new system. Also the book discusses reasons why the ohm should be added as a fourth basic unit.

Science News Letter, March 16, 1940

PHYSICS

THE JOURNAL OF THE ACOUSTICAL SOCIETY OF AMERICA, Cumulative Index, VOL. 1-10—*Published for the Acoustical Society of America by the American Institute of Physics*, 131 p., $3.

Science News Letter, March 16, 1940

PHARMACY

BIOLOGICAL PRODUCTS—Louis Gershenfeld—*Romaine Pierson*, 244 p., $4. Chemists, pharmacists and physicians will find in this book much information on the manufacture, standardization and use of vaccines, serums and other biological products.

Science News Letter, March 16, 1940

ENGINEERING

ELEMENTARY SURVEYING — Warren C. Taylor—*International Textbook*, 236 p., $1.80. The associate professor of civil engineering at Union College gives the fundamentals of surveying, basic requirement of all civil engineers, whether they later turn into professional surveyors or not. Compact, and clearly written, the little textbook is filled with problems which greatly enhance its usefulness.

Science News Letter, March 16, 1940

AERONAUTICS

PRIVATE PILOT'S HANDBOOK — W. C. Chambliss and W. F. McDonald—*Aerotext Pub. Co.*, 129 p., $2.50. Navigation, meteorology and civil air regulations for the private pilot.

Science News Letter, March 16, 1940

PHYSICS

A SURVEY OF ELEMENTARY PHYSICS—Linville L. Hendren—*Univ. of Georgia Press*, 393 p., $2.25. An elementary physics text as used at the University of Georgia for a survey course to be covered in one-quarter of the academic year.

Science News Letter, March 16, 1940

MATHEMATICS

THE MATHEMATICAL THEORY OF NON-UNIFORM GASES—Sydney Chapman and T. G. Cowling — *Cambridge (Macmillan)*, 404 p., $7.50. An advanced text of British origin designed for mathematicians and theoretical physicists. A most excellent book, but heavy going even for graduate students in physics.

Science News Letter, March 16, 1940

PSYCHOLOGY

CONQUERING THE MAN IN THE STREET —Ellis Freeman—*Vanguard Press*, 356 p., $3.50. A "Psychological Analysis of Propaganda in War, Fascism, and Politics" which is in itself a very good example of propaganda against the Nazis and "brutalitarian" regimes. The author sees Hitler in the role of quack psychiatrist professing to treat the mental ills of the German people but actually aggravating their unfortunate condition. He feels that propaganda similar to Hitler's effective brand but going by the name of Americanism might gain listeners in the United States.

Science News Letter, March 16, 1940

PHYSICS—ASTRONOMY

A SURVEY OF PHYSICAL SCIENCE; Part I, Physics and Astronomy—Linville L. Hendren—*Univ. of Georgia Press*, 556 p., $3.25. The text for a survey course in the physical sciences as taught at the University of Georgia.

Science News Letter, March 16, 1940

GENERAL SCIENCE

POPULAR SCIENCE TALKS, Vol. XIII—Faculty of the Philadelphia College of Pharmacy and Science — *Philadelphia College of Pharmacy and Science*, 241 p., $1. Interesting popularizations, mostly medical, continuing effectively the work of previous volumes in this series.

Science News Letter, March 16, 1940

CHEMISTRY

GENERAL AND INORGANIC CHEMISTRY —P. J. Durrant—*Longmans, Green*, 547 p., $2.75. A text for first-year university courses in England. This very complete book would be difficult to cover in a one-year course in most American universities but its thoroughness will appeal to any serious teacher who can pick and choose from its content to round out his own course.

Science News Letter, March 16, 1940

HISTORY

HANDBOOK OF THE WAR — John C. de Wilde, David H. Popper and Eunice Clark — *Houghton Mifflin*, 248 p., $2. The background of the war, the story of its beginnings and the maneuverings that went on before the shooting began, weapons and tactics, strategy both military and economic: a book that will not remain up to date very long but which is decidedly worth reading now while it is still new.

Science News Letter, March 16, 1940